CLAIMS

1. An analogue audio signal processor, comprising an input for receiving an audio input signal, an output for providing a processed audio output signal, and a tone control circuit coupling the input to the output and comprising first and second log-domain filters having different low-pass bands and a subtractor for subtracting the output currents of the filters to produce a filtered signal, each of the filters comprising MOS transistors operating in weak inversion.

2. A processor according to claim 1, further comprising a compressor coupling the input to the tone control circuit for compressing the dynamic range of the input signal.

3. A processor according to claim 2, wherein the compressor is a voltage-to-current converter.

4. A processor according to claim 2 or 3, wherein the compressor comprises MOS transistors operating in weak inversion.

5. A processor according to claim 4, wherein the compressor is configured to provide control of sensitivity.

6. A processor according to any of claims 1 to 5, further comprising an amplifier for amplifying the filtered output signal of the tone control circuit.

7. A processor according to any of claims 1 to 6, wherein the input signal is a current signal.

8. A processor according to any of claims 1 to 7, further comprising a biphase signal generator for supplying to the output a biphase signal modulated by the processed audio output signal.

9. A processor according to any of claims 1 to 8, further comprising full-wave rectification means for full-wave rectifying the processed audio output signal.

10. A processor according to claim 9, wherein the tone control circuit further comprises third and fourth filters having low-pass bands substantially identical to the first and second filters respectively and a further subtractor for subtracting the output currents of the third and fourth filters to produce a further filtered signal, and the full-wave rectification means comprises means coupled to the input for producing oppositely-phased audio signals from the input signal, one of the oppositely-phased audio signals being supplied to the first and second filters and the other of the oppositely-phased audio signals being supplied to the third and fourth filters, half-wave rectification means for half-wave rectifying the filtered signals from the first-mentioned and further subtractors, and a combiner for combining the half-wave rectified signals to effect full-wave rectification.

11. A processor according to claim 10, wherein the third and fourth filters are log-domain filters comprising MOS transistors operating in weak inversion.

12. A processor according to claim 10 or 11, wherein the half-wave rectification means comprises means for applying a dc offset to the filtered signals.

13. A processor according to any of claims 1 to 12, comprising only one output.

14. A processor according to any of claims 1 to 12, comprising a plurality of outputs for providing processed audio signals, and wherein the tone control circuit is common to all the outputs for simultaneously adjusting the intensity/frequency of the processed audio signals at the outputs.

15. A processor according to claim 14, further comprising frequency separation means for separating the intensity/frequency adjusted audio signal into a plurality of frequency-separated signals having different frequency bands.

16. A processor according to claim 15, wherein the frequency separation means comprises a plurality of band-pass filters.

17. A processor according to claim 16, wherein the band-pass filters are log-domain filters comprising MOS transistors operating in weak inversion.

18. A processor according to any of claims 15 to 17, further comprising a plurality of biphase signal generators for supplying biphase signals modulated by respective ones of the frequency-separated signals to respective ones of the outputs.

19. A processor according to claim 18, further comprising sampling means for applying samples of the frequency-separated signals to the respective biphase signal generators.

20. A processor according to claim 19, wherein the sampling means comprises a continuous interleaved sample generator.

21. A processor according to any of claims 1 to 20, where configured such that the intensity/frequency is controllable by a user.

22. A processor according to claim 21, comprising means controllable by the user for adjusting the frequency response of the tone control circuit.

23. A processor according to claim 22, comprising user controls for controlling bass cut/boost and treble cut/boost.

24. A processor according to any of claims 21 to 23, comprising a user control for controlling signal amplitude.

25. A processor according to any of claims 1 to 24, wherein the or each subtractor has a control input for controlling signal amplitude.

26. A processor according to any of claims 1 to 25, when implemented as a single chip analogue MOS integrated circuit.

27. An aural prosthetic device comprising the processor according to any of claims 1 to 26.

28. A hearing aid comprising the processor according to any of claims 1 to 26.

29. A cochlear implant prosthesis comprising the processor according to any of claims 1 to 26.

30. A multi-channel analogue audio signal processor for use with a cochlear prosthesis, comprising:
an input for receiving an audio signal;
a plurality of outputs for connection to respective ones of cochlear implant electrodes;
a plurality of analogue signal processing channels coupled to the input, each channel comprising a log-domain filter comprising MOS transistors operating in weak inversion and being coupled to a respective one of the outputs; and
adjustment means for adjusting the intensity/frequency response of each channel.

31. A processor according to claim 30, wherein each channel further comprises an amplifier having controllable gain, the gain of which amplifier is adjustable by the adjustment means.

32. A processor according to claim 30 or 31, wherein the adjustment means includes a control interface for allowing adjustment of the gain of each

channel in response to control signals transmitted by a wireless remote control.

33. A processor according to any of claims 30 to 32, further comprising a tone generator for generating tones of preset amplitude and frequency dependent on the fundamental frequencies of the filters of the channels.

34. A processor according to claim 33, further comprising tone generator control means for selecting the frequency of the tone produced by the tone generator.

35. A processor according to claim 34, wherein the tone generator control means comprises a wireless remote control.

36. A processor according to any of claims 30 to 35, where configured such that each channel is adjustable independently of all the other channels.

37. A processor according to any of claims 30 to 36, further comprising sampling means coupling the channels to the outputs.

38. A processor according to claim 37, wherein the sampling means comprises a continuous interleaved sample generator.

39. A processor according to any of claims 30 to 38, further comprising a plurality of biphase signal generators for supplying to the outputs biphase signals modulated by the output signals of the channels.